Assessment of Natural Gas Combined Cycle (NGCC) Plants with CO2 Capture and Storage

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Agenda

1:30 Welcome and Introductions
Mike Gravely - Energy Commission

1:40 Overview of the Energy Commission's WESTCARB efforts
Elizabeth Burton – WESTCARB Technical Director

1:55 Administrative Logistics
Andrew Ferrin - Energy Commission

2:20 Administrative Q&A
Andrew Ferrin - Energy Commission

2:30 Break

2:45 Bevilacqua-Knight, Inc's Role and Reference Documents
Rich Myhre – Bevilacqua-Knight, Inc

3:05 Pacific Gas & Electric's Role
Emma Wendt – Pacific Gas & Electric

3:25 Livermore National Laboratory's Role and Reference Documents
Elizabeth Burton – WESTCARB Technical Director

3:45 Open Discussion (Q&A)

California Energy Commission Responsibilities

- Forecasting future energy needs and keeping historical energy data.
- Licensing thermal power plants 50 megawatts or larger.
- Promoting energy efficiency by setting the state's appliance and building efficiency standards and working with local government to enforce those standards.
- Supporting renewable energy by providing market support to existing, new, and emerging renewable technologies; providing incentives for small wind and fuel cell electricity systems; and providing incentives for solar electricity systems in new home construction.
- Implementing the state's Alternative and Renewable Fuel and Vehicle Technology Program.
- Planning for and directing state response to energy emergencies.
- Supporting public interest energy research that advances energy science and technology through research, development, and demonstration programs.

PIER Program Overview

- IOU Ratepayer Funded Program
- Launched in 1997 by AB1890
- $86.5 Million Annual Budget FY 10/11
  - $62.5 million electric
  - $24 million natural gas
- Program Research Areas
  - Energy Efficiency & Demand Response
  - Renewable Energy & Advanced Electricity Generation
  - Transmission & Distribution
  - Climate & Environment
  - Transportation

Legislation and PIER

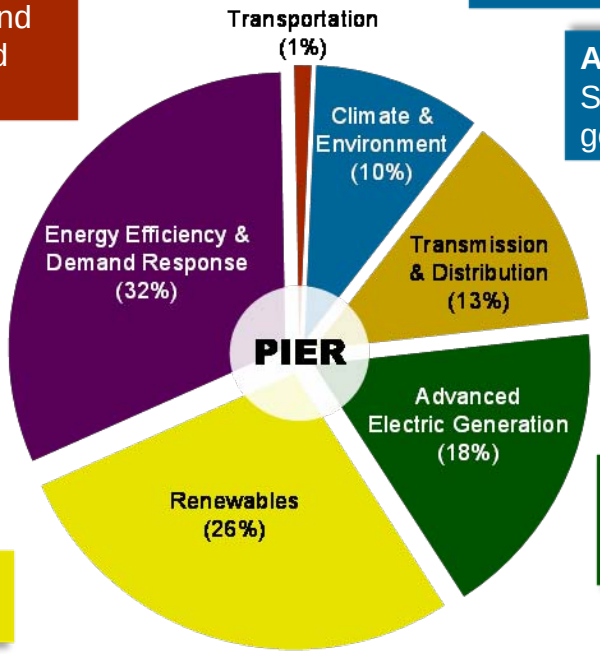
Funding Total: $587.7 million from 1997 - 2008

SB 375 – Land-Use Planning and GHG Emissions

AB 1007 – Transportation and Alternative Fuels

SB 1368 – GHG Emissions standards for POUs

AB 118 – Alternate and Renewable Fuels and Vehicles Deployment



AB 32 – Global Warming Solutions Act of 2006; aggressive goals for 2020

AB 2021 – Energy Efficiency for POUs

SB 1250 – PIER and Renewables Incentive Programs Reauthorized

AB 2160 – Green Building Acquisition Financing for State Facilities

AB 2778 – Self-Generation Incentive Program for Fuel Cells and Wind

SB 107 – Accelerated RPS Goals

SB 1250 – PIER and Renewables Incentive Programs Reauthorized

SB 1 – Renewables Goals for New and Existing Residential and Commercial Structures

PIER Smart Grid Research Ongoing at all Levels

Transmission

- Phasor Measurement
- Advanced displays
- Advanced comm & controls
- MRTU interface
- Energy Storage
- Renewables

Distribution

- Distribution Automation
- AMI
- Advanced C&C
- MRTU
- Energy Storage
- Renewables

Integration

- Renewables
- Standards
- Protocols
- Reference designs
- Micro Grids
- Automation
- Energy Storage

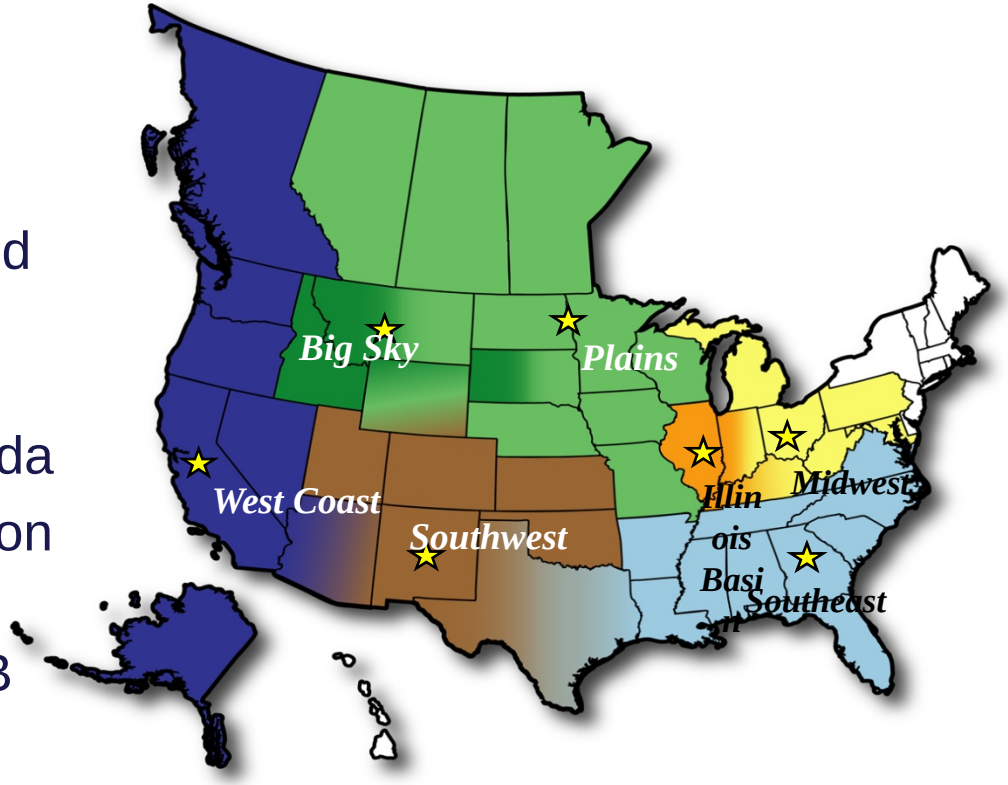
Consumer

- Automating Demand Response
- AMI
- Dynamic Rates
- Home Area Networks
- Plug in Hybrids
- Renewables
- Energy Storage

Background

WESTCARB: One of Seven Regional Carbon Sequestration Partnerships

- DOE program initiated in 2003
- Opportunities for geologic and terrestrial CO_2 storage evaluated throughout U.S. and Canada
- Over 350 participating organizations in U.S. and Canada
- Program focus on implementation issues
- Hawaii now part of WESTCARB



WESTCARB Budget History

	Phase I	Phase II	Phase III
	2 years	4 years	10 years
Federal – including direct funding to national labs	1,600,000	17,931,100	65,606,584
PIER**	1,686,912	2,554,712	5,268,418
Third-Party Cost Share	264,000	7,896,446	19,719,100
TOTAL	3,550,912	28,382,258	90,594,102

Proposed Contract Tasks

1) Evaluation of CO_2 capture technology options for use on NGCC plants

2) An engineering and economic assessment report of the installation and operation of CCS technologies in both retrofit and new-build applications, at California utility-scale NGCC plants

3) Preliminary design for a pilot-scale CO_2 capture, compression/dehydration, and injection well test facility